New version of patent claims 1 to 11

1. A computer tomograph having:

- a radiation source (41) for emission of X-ray radiation (40) with a predetermined intensity and a predetermined spectrum;
- a detector unit (2), which comprises a large number of detectors (1), for verification of X-ray radiation (40), with the individual detectors (1) in the detector unit (2) being designed to receive incident X-ray quanta in the X-ray radiation (40) and to detect the intensity of the received X-ray radiation (40);
- a transmission device (43) for transmission of the information detected by the detectors (1) in the detector unit (2) to an evaluation device (44); and
- an evaluation device (44) which is designed to calculate a measurement result from a measurement object (42) through which the X-ray radiation (40) has passed on the basis of the information detected by the detectors (1) in the detector unit (2);

characterized

in that the individual detectors (1) in the detector unit (2) are designed to also detect the quantum energy of the individual X-ray quanta in the received X-ray radiation (40), and in that the evaluation device (44) is also designed to calculate the measurement result from the measurement object (42) on the basis of the information detected by the detectors (1) relating to the intensity and quantum energy of the individual X-ray quanta in the received X-ray radiation (40), taking into account the intensity and the spectrum of the X-ray radiation (40) emitted from the radiation source (41).

2. The computer tomograph as claimed in claim 1, characterized

in that the detectors (1) in the detector unit (2) have a large number of parallel-connected comparators (131, 132, 133), each having a threshold value, and
in that each comparator (131, 132, 133) has an associated counter (151, 152, 153), and the comparators (131, 132, 133) are designed to increment the respectively associated counter (151, 152, 153) by one unit when the quantum energy of an X-ray quantum in the received X-ray radiation (40) exceeds the threshold value of the respective comparator (131, 132, 133).

3. The computer tomograph as claimed in claim 2, characterized
in that the threshold values of the comparators (131, 132, 133) are freely variable.

4. The computer tomograph as claimed in claim 2 or 3, characterized
in that the detectors (1) in the detector unit (2) have a large number of pulse logic devices (141, 142, 143), with one pulse logic device (141, 142, 143) in each case being connected downstream from the respective comparators (131, 132, 133) and upstream of the respective counters (151, 152, 153), and the pulse logic devices (141, 142, 143) providing time normalization of the output signals from the comparators (131, 132, 133).

5. The computer tomograph as claimed in one of the preceding claims,
characterized
in that the detectors (1) in the detector unit (2) have a receiving area (3) for the X-ray radiation (40), which receiving area (3) is formed from gadolinium-oxysulfide ceramic, bismuth germanium oxide or lutetium oxyorthosilicate.

6. The computer tomograph as claimed in one of claims 1 to 4,
characterized
in that the detectors (1) in the detector unit (2) have a direct-conversion receiving area (3) for the X-ray radiation (40),

which receiving area (3) is formed from cadmium zinc telluride or cadmium telluride.

7. A method for verification of X-ray radiation by means of a computer tomograph which has a detector unit (2) comprising a large number of detectors (1), having the following steps:

- detection of the intensity of the X-ray radiation (40) received by means of a detector (1) in the detector unit (2);
- transmission of the information obtained by means of the detectors (1) to an evaluation device (44); and
- calculation of a measurement result from a measurement object (42) through which the X-ray radiation (40) has passed, by means of the evaluation device (44) on the basis of the information detected by the detectors (1);

characterized

in that the quantum energy in the individual X-ray quanta in the X-ray radiation (40) received by means of one detector (1) in the detector unit (2) is detected, and

in that the measurement result from the measurement object (42) is calculated by means of the evaluation device (44) on the basis of the information detected by the detectors (1) relating to the intensity and quantum energy of the individual X-ray quanta in the received X-ray radiation (40), taking into account the intensity and the spectrum of the X-ray radiation (40) emitted from a radiation source (41).

8. The method for verification of radiation as claimed in claim 7,

characterized

in that the detection of the X-ray quanta which are received by means of the detector (1) in the detector unit (2) comprises the following steps:

- detection of a signal which is produced in the detector (1) as a consequence of a received X-ray quantum, whose signal level

is proportional to the quantum energy in the received X-ray quantum;

- comparison of the signal level with a large number of predetermined threshold values;
- incrementation of a counter (151, 152, 153), which is in each case associated with one range between two adjacent threshold values, by one unit when the signal level of the signal is in the range between the two adjacent threshold values.

9. The method for verification of radiation as claimed in claim 7,
characterized
in that the detection of the X-ray quanta which are received by means of the detector (1) in the detector unit (4) comprises the following steps:

- detection of a signal which is produced in the detector (1) as a consequence of a received X-ray quantum, whose signal level is proportional to the quantum energy in the received X-ray quantum;
- comparison of the signal level with a large number of predetermined threshold values;
- incrementation of counters (151, 152, 153), which are each associated with one threshold value, by one unit when the signal level of the signal exceeds the respective threshold value.

10. The method for verification of radiation as claimed in claim 8 or 9,
characterized
in that a signal which is produced in the detector (1) as a consequence of a received X-ray quantum is rejected if the determined signal level of the signal is lower than a lowest threshold value.

11. The method for verification of radiation as claimed in claim 8, 9 or 10,
characterized

in that the threshold values are freely variable.